

REQUEST FOR RECONSIDERATION

Applicants thank Examiner Carrillo for the helpful and courteous discussion with Applicant's U.S. representative of April 5, 2005. During the discussion, Applicant's representative explained that a process that includes contacting cork with a supercritical fluid in the presence of water can concurrently remove compounds such as TCA from cork and substantially reduce microbial growth.

New Claims 31-57 have been added. New independent Claim 31 is drawn to a process that includes contacting a cork or a cork-based material with a dense fluid under pressure at certain temperature and pressure conditions. The dense fluid under pressure comprises a cosolvent and is in a supercritical state. The claimed process is useful for applications including, but not limited to, treating corks used as closures in wine bottles.

When certain organic compounds such as polychlorophenols or anisols such as trichloroanisol (i.e., TCA) are present in foodstuffs such as wine, a perceptible off-taste is imparted to the foodstuff. In the wine industry, this is referred to as "cork-taint". The claimed process provides a way by which cork can be treated to remove the compounds that lead to such undesirable effects. The process is effective for removing undesirable organic compounds which may create an undesirable taste and/or smell in a product being held, for example, in a bottle sealed with a cork closure. In addition to the improvement in the quality of the foodstuff, the claimed process is able to inhibit, reduce or completely eliminate microbial growth that takes place in natural corks.

Applicants submit herewith a Declaration under 37 C.F.R. § 1.132. The Declaration contains extraction and extraction efficiency data for processes that include contacting cork with a dense fluid under pressure. The data provide a comparison of the extraction results and extraction efficiencies of a process that is carried out with and without a cosolvent. As is shown in the tables of the Declaration, when the process is carried out in the presence of a

cosolvent (i.e., when a cosolvent has been added to the dense fluid), significantly more TCA is removed from the cork. Thus, the claimed process provides substantially improved performance with regard to removing the organic compounds such as TCA that lead to undesirable taste/smell effects.

Applicants have demonstrated that superior TCA extraction is achievable when the dense fluid under pressure comprises a cosolvent. As stated by the Applicant:

It is further my opinion that one of ordinary skill in the art would not foresee such an improvement because undesirable compounds such as TCA have low water solubility therefore one may not expect improved removal of compounds such as TCA when a cosolvent (e.g., water) is added to the solvent (e.g., dense fluid under pressure-CO₂) before carrying out the extraction.

Applicants have rebutted the Office's assertion of obviousness by providing information demonstrating that the claimed process is not obvious in view of the cited prior art.

The Office rejected previously presented Claims 4 and 7 as obvious under the meaning 35 U.S.C. §103(a) in view of a publication Chouchi ("SFE of Trichloroanisole from Cork," The 40th International Symposium on Supercritical Fluids, May 11-14, Japan 1997) and/or Maricato ("Etude del'Extraction du Trichloroanisole Par CO₂ Supercritique"). The Office characterizes the subject matter of the rejected claims (i.e., Claims 4-5, 7-18, 24-29 and 31-36) as obvious because:

In reference to the dependent claims, the limitations are obvious variants since Maricato teaches supercritical carbon dioxide to extract organic contaminants from cork. (Page 5, lines 7-8 of the Office Action of March 7, 2005)

Applicants submit the Office has not set forth a *prima facie* case of obviousness for at least the subject matter of dependent Claim 7. Applicants draw the Office's attention to MPEP §2142 - Legal Concept of *Prima Facie* Obviousness where it is stated:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or

motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Applicants submit the Office identified no suggestion or motivation to modify the teachings of the cited prior art to render the subject matter of the dependent claims obvious. This, the rejection under 35 U.S.C. §103(a) is improper and should be withdrawn.

With respect to the subject matter of previously preferred dependent Claim 7 (see new Claim 31), Applicants submit that the cited prior art does not disclose a process which includes treating cork or a cork-based material with, for example, a supercritical gas which comprises a co-solvent and thereby provide improved extraction efficiency of an organic compound such as TCA from the cork. Applicants submit the Declaration submitted herewith demonstrates the patentability of the claimed subject matter over the cited prior art and respectfully request withdrawal of the rejections.

With respect to the subject matter of previously presented Claims 4-5, Applicants submit that the cited prior art does not disclose a process which involves subjecting cork to a series of compression/decompression cycles wherein the pressure of, for example, a supercritical fluid is raised and lowered in an alternating fashion or with the compression/decompression periodicity recited in new Claim 45.

Further with regard to the subject matter of new Claim 31, Applicants draw the Office's attention to the disclosure in the original specification such as on page 16, lines 24-29:

Surprisingly, according to the invention, it was observed that the addition of a co-solvent to the dense fluid under pressure can result in total extraction of contaminating and polluting organic compounds, in other words undesirable compounds from cork or a cork-based material.

As mentioned above, the addition of the co-solvent guarantees selective extraction of undesirable organic compounds, while maintaining acceptable levels of the content of compounds naturally present in the cork such as ceroids, suberine, lignin and cellulose.

In other words, the addition of an appropriate co-solvent is a means of controlling the selectivity towards the extraction of pollutants, contaminants and undesirable organic compounds that are to be eliminated and extracted.

Furthermore, and completely surprisingly, it has been observed that the addition of a co-solvent causes a reduction in the growth of micro-organisms very much greater than the reduction obtained by CO₂ alone, due to a type of synergy effect, and this reduction in the growth of micro-organisms can change from a factor of 100 to a factor of 1,000,000 when the co-solvent is added. (Page 16, line 24 through page 17, line 16).

Applicants provided comparative data in the specification showing that the presence of a co-solvent in the dense fluid during the contacting of the claimed process substantially reduces the growth of micro-organisms in the resulting extracted cork or cork-based product. Applicants draw the Office's attention to Example 3 bridging pages 39 and 40 of the specification. Example 3 shows that the anti-microbial efficiency of an extraction process wherein water is present as a co-solvent is substantially greater than the anti-microbial efficiency of a process carried out with only a dense fluid (e.g., supercritical CO₂). As can be seen in Figure 4 (which plots the reduction in microbial growth as the vertical axis), the presence of a co-solvent substantially reduces microbial growth in comparison to an extraction process carried out with only carbon dioxide. Applicants proffer a theory for the improvement in antimicrobial activity:

Without being restricted to any particular theory, it is probable that even small proportions of water in the presence of CO₂ produce carbonic acid such that the pH of the mix becomes acid.

The combined action of pressure and acidity thus produces an effect that is highly damaging to the survival of the microorganisms present. (Page 40, lines 20-26).

Thus, for processes of treating or contacting cork or a cork-based product with a dense fluid (e.g., supercritical CO₂) in the presence of a co-solvent (e.g., water) a significant improvement in the reduction of micro-organism growth is achieved. Applicants submit that the prior art relied upon by the Office does not suggest or disclose any such effect or advantage obtainable by using a mixture of a dense fluid and co-solvent.

Applicants submit that the experimental results shown for the CO₂/water extraction medium comparative examples are probative of the non-obviousness of the subject matter of, for example new Claim 31, and respectfully request withdrawal of the rejection.

With regard to the subject matter of dependent Claim 4, Applicants draw the Office's attention to the following disclosure in the specification as originally filed:

Thus, according to the invention, during the treatment it is possible to carry out compression/decompression cycles, preferably very fast cycles for example with an amplitude of the pressure variation of from 10-100 bars and time intervals varying from 10 seconds to a few minutes, for example 10 minutes, the complete process continuing for example for between 1 and several hours, for example 10 hours.

This increase the penetration of the solvent fluid into the material, which has the result of improving the cleaning performances and the internal flexibility of the cork. (page 13, lines 3-14).

Applicants have described that a process which includes fast cycling of compression/decompression cycles can improve the extraction capability. Applicants submit that no such process is disclosed in the cited prior art.

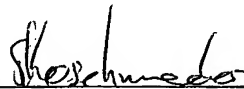
INFORMATION DISCLOSURE STATEMENT

Applicants filed an Information Disclosure Statement (IDS) on August 27, 2002 providing a list of references cited on an International Search Report. The Office returned a partially initialed copy of the form PTO-1449 listing the references of the IDS in an Office Action of April 21, 2003. The PTO-1449 returned with the Office Action did not include the Examiner's initials next to the first reference provided thereon (i.e., U.S. 5,364,475). Applicants respectfully request the Examiner return a signed, dated and initialed copy of the form PTO 1449 submitted with the IDS of August 27, 2002 to thereby acknowledge that all references provided thereon have been considered in the examination of the above-identified application.

Applicants submit herewith an IDS concurrently with an RCE. Applicants respectfully request the Office acknowledge consideration of the references provided therein by returning a signed, dated and initialed copy of the form PTO-1449 submitted therewith in the next communication from the Office. The IDS provides references cited in the opposition proceedings in an European patent corresponding to the present U.S. application.

Respectfully submitted,

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